(Pamphlet No. 62)

TANGANYIKA
DEPARTMENT OF AGRICULTURE

Twenty-second Annual Report of the Coffee Research and Experimental Station, Lyamungu, Moshi for the 1955/56 Season

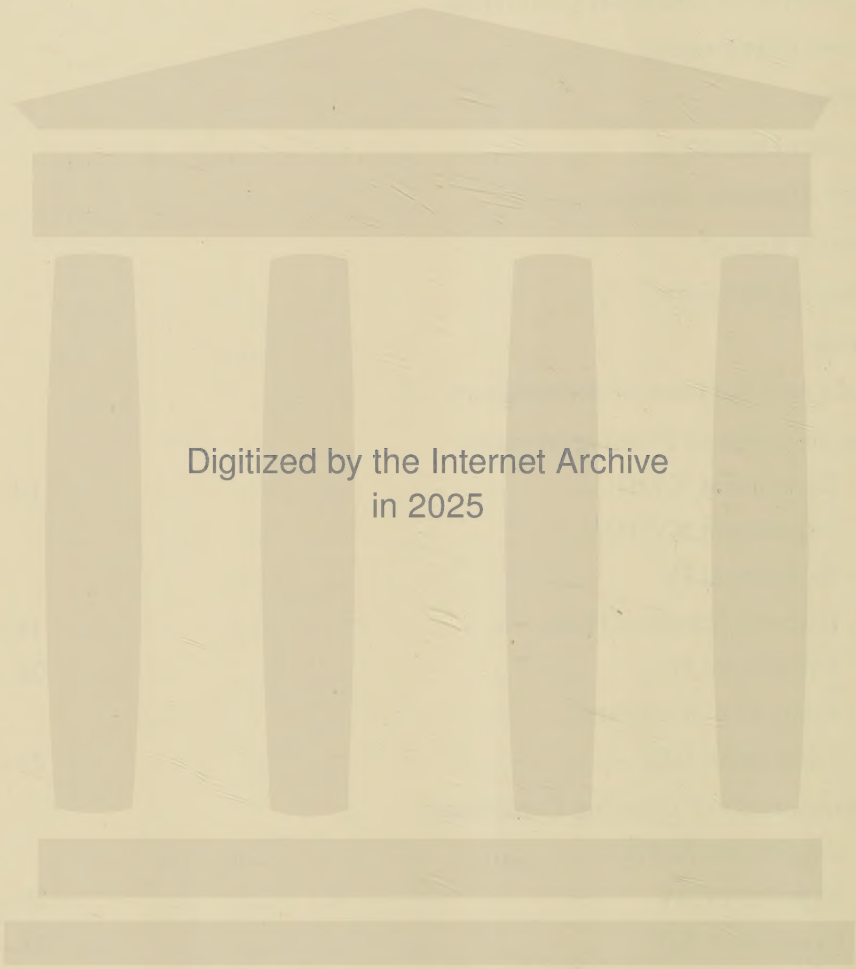
1956
PRINTED BY THE GOVERNMENT PRINTER
DAR ES SALAAM
Price Shs. 2/50

COMMONWEALTH MYCOLOGICAL INSTITUTE
2 APR 1957

Twenty-second Annual Report of the Coffee Research and Experimental Station, Lyamungu, Moshi for the 1955/56 Season

CONTENTS

	Page
General	1
Improvement of Plant Material	2
Improvement of Growing Conditions	3
Pruning Experiments	4
Breeding	5
Pests and Diseases	5
Wound Dressing Trials	5
Chemist's Report	6
Processing Methods	7
Visitors	9
Details and Records of Experiments	10
Improvement of Planting Material:	
Experiment XVIII	10—15
Experiment XVIIIA	16
Experiment IV	17
External Selection Trials	18—24
Experiment II	24—26
Kents Plot Selections	27
Experiment IIIB	27—28
Improvement of Growing Conditions:	
Experiment XIVA	29
Experiment XV	29—30
Experiment XIX	31—32
Experiment XIII	32
Experiment XXI	32—33
Miscellaneous Pruning Trial No. 1	33
Statement Showing Grades and Classification of the 1955–1956 Crop	33—34
Rainfall Records—September, 1934–1955	35



Digitized by the Internet Archive
in 2025

https://archive.org/details/research-report-coffee_1955-1956_22

COFFEE RESEARCH AND EXPERIMENTAL STATION, LYAMUNGU, MOSHI

Report for the 1955/56 Season

General

The main flowerings occurred in late November and early December, 1954, in mid-January (as a result of irrigation), and in mid-February, 1955. During the early part of the season coffee was slow to ripen, and the harvest in the months of June and July amounted to little more than "fly" picking. About mid-August the coffee ripened rapidly, with the result that the coffee was harvested in a fairly short period, the peak of which was in October. Harvesting was completed by early December. Picking was continued on some of the off-station trials until January, 1956.

The total crop from the 129 acres of bearing coffee was equivalent to 66·08 tons of clean coffee, an average yield of 10·01 cwt. per acre. The average yield for the past eight years has been 8·73 cwt. per acre. The out-turn figure was 382 debes of cherry per ton of parchment.

Of the coffee sent to the mills, 81 per cent was graded AA, A or B. Fifteen per cent was class 3, and eighty per cent of the crop was class 5 or higher.

The heavy demand for seed continued and 5,601 lb. was sold to growers.

The dry weather experienced at the end of 1954 continued until the first fortnight in February, 1955, when 6·07 inches of rain were recorded. This was followed by a hot dry period until the end of March. Irrigation, which had been commenced in the last quarter of 1954, was applied at intervals to some of the experiments until the rains of February, 1955. The rains of February and March amounted to 10·87 inches. The long rains started on 7th April and were well distributed and protracted, although the total fall was slightly below the average. Small amounts fell throughout July, and it was not until early August that the long rains can be said to have ceased. In all, the long rains produced 40·00 inches. Instead of the overcast weather usually expected in June and July, showers followed by hot sunny periods were experienced. Virtually no effective rain fell after the first week in August until the drought was broken on 5th November. Small but effective falls then occurred at intervals throughout the month, yielding a total of 2·78 inches.

The variety collection was further extended by the addition of sixteen new introductions. The additions include Hemileia resistant types from the Coffee Research Station, Balehonnur, South India.

Some 826 plants, the results of controlled cross-pollination of certain selections, were planted out in an Observation Plot, where their individual yields will be recorded and other characteristics observed. Provision has been made for additions to this Observation Plot as new material becomes available. In order

to obtain further data on the relative performance of clones and seedlings, some of the progeny of the selfed seed was used to lay out a small trial to compare rooted cuttings, seedling progeny (selfed seed) and seedling progeny (open-pollinated seed) of the same selection. Single tree plots were used, to make the best use of the available plants. This trial has been numbered Experiment IIIC.

Analysis of the soils in those plots in Experiment XV (Irrigation and Mulch) to which banana trash had been applied for twelve years showed a considerable increase in potassium. To determine whether potassium is in fact responsible for the high yields obtained from the mulched plots, a trial in which the effects of potash and banana trash can be compared was superimposed on four Latin squares in Experiment XVIII (Clonal Selection Trials). The treatments were first applied in June, 1955; soil samples were taken prior to the application of the treatments.

Two obsolete experiments were adapted to study the effect of some possible methods of rehabilitating areas which were declining in productivity. In Experiment IB, two possible methods of rejuvenating old coffee by pruning are being compared with uprooting and planting new coffee (in the same position) and leaving the old coffee. In the second trial, Experiment IXA, replanting with new plants of the same origin was the only treatment applied.

A new experiment, comparing the effects of plant density (1 per hole, 2 per hole and 4 per hole) in combination with three pruning systems (single stem, multiple stem and Colombian system) was planted.

The clearing of Lyamungu Coffee Estate was continued and at the end of the period under review the felling of the trees had been completed. On all except 70 acres logging had been completed and the land ripped and ploughed. Eighty acres were then put down to maize in March, 1956, and grass was planted on a further 60 acres. The scrub in the 30 acres of Albizzia forest was cleared and *Pennisetum salifax* was planted.

An overhead irrigation unit capable of applying 2 inches per acre over 6 acres in 14 hours was purchased during the year.

Short courses for Agricultural Instructors and extended courses for student-labourers were held during the year.

The labour supply was inadequate during the greater part of the season.

Improvement of Planting Material

Clonal Selection Trials.

There was a heavy crop in the various squares of these trials (Experiment XVIII), in most cases yields of more than one ton of clean coffee per acre were recorded and it is a noteworthy fact that very little dieback occurred.

In the last report it was noted that the clones KP 423, KP 162, KP 532, H 66, KP 154, KP 227 and X 321 (all selections within the Kent variety) which had given the highest average yield up to 1953, had given a crop in 1954 (the "off" year) many times larger than the remainder of the selections on trial. In the season under review all of these clones yielded at a rate of more than one ton of clean coffee to the acre. KP 423 has now averaged 16·95 cwt. per acre over its first nine years of bearing, and it has never failed to give less than 6·80 cwt. in any season.

The two Latin squares comprising Experiment XVIIIA yielded well for the second consecutive season. The mean yield for the first three bearing years shows that the multiple stem plots have out-yielded the single stem plots of the same clone in every case. The two Kent selections in each square were the highest yielders on both the pruning systems.

The recording of off-station selection trials was continued. Very heavy yields were recorded in the Mbosho selection trial, which was planted in April, 1952. The plots are paired for comparison of multiple and single stem pruning systems. The selection I/255 yielded 19·73 cwt. per acre and 35·85 cwt. on the single stem and multiple stem system respectively in the 1955 season. With the exception of the selection AC80, the eighteen selections in this trial have, for the two-year period, yielded very much better on the multiple stem system. The mean yield for the single stem system for all the selections was 10 cwt. per acre, while that for the multiple system was 18 cwt. per acre.

The trial at Mwika of the same selections, and for the same period, has not shown any advantage in favour of the multiple stem system. The very rapid growth rate at Mbosho is probably responsible for this very marked difference in yield between the two systems to have occurred so early.

All the off-station selection trials will have to be continued for some years before the selection most suitable to a particular area can be ascertained.

Clones versus Seedlings.

In Experiment IIIB where the yields of clones and seedlings (seedlings of the clone, seedlings of original parent and second generation seedlings) of three high-yielding selections are being compared, three years records are now available but records for a much longer period will be necessary before the relative merits of clones and these seedlings can be assessed. In a previous report it was noted that in the first year of bearing the clonal progeny out-yielded the seedling progeny, confirming the findings in a previous experiment.

This particular experiment is unshaded and the trees have been trained on a modification of the multiple stem system. The whole area was mulched with banana trash for the first two years of the experiment. The yields show what can be obtained with adequate soil moisture and good planting material. In the third season in the field, the mean yield was 8 cwt. of clean coffee per acre, in the following season it cropped at 1 ton to the acre, and this was followed by a crop 16·6 cwt. per acre. The mean for the three seasons is 15 cwt. per acre.

Improvement of Growing Conditions

Cultural Experiments.

In Experiment XV where mulch and irrigation are the treatments, the analysis of the yields for the four years since the treatments were modified shows that irrigation has not increased yields, but as was noted in last year's report, the rainfall distribution during the first three seasons was such as to make the application of the irrigation treatments virtually unnecessary. Irrigation cannot therefore be considered a treatment during this period. In the fourth season, as judged by crop, irrigation had no effect, despite the long dry period from June, 1954 to January, 1955.

Mulch has effected a considerable increase in yield in each of the four seasons.

The yields from the nil treatment, and the irrigated plots in the 1955/56 season were negligible, being less than 0·5 cwt. per acre; those from the mulched plots were also very low at 1½ to 2½ cwt. per acre.

The mean yield from the non-mulched plots for the first three years was 8·23 cwt. per acre, while the mulched plots yielded 11·61 cwt. per acre. The very low yields in the fourth season show that even with adequate moisture the soil, either with or without mulch, is not able to provide nutrients in the quantity and/or rate to maintain cropping at a high level over a period.

The higher yields from the mulched plots show that the mulch has had a manurial effect.

The recording of the yields from Experiment XIVA (Guinea grass, Elephant grass and Banana trash as mulches and compost) for residual effects has been continued. The analysis shows that in two of the four years the residual effects of each of the treatments has resulted in a significantly higher crop, but for the four-year period as a whole the differences, though marked, are not significant.

There is, however, sufficient evidence to warrant laying down an experiment to investigate at what intervals the various mulches and compost should be applied to give the greatest economic return.

In Experiment XIX, which has high Albizzia shade, the presence of interplanted bananas showed the same tendency as in previous seasons but the extent of the depression of yield was not significant in 1955—an "off" year. For the four-year period, the presence of bananas at 90 stools per acre has reduced the yield of the coffee, which is being grown on the multiple stem system, from 7·80 cwt. to 5·54 cwt. per acre; with 135 stools per acre the coffee yield is still further reduced to 4·80 cwt. per acre. Farmyard manure, even when applied to both coffee and bananas, has not raised the level of cropping to that of the plots with no interplanted bananas. In the plots with bananas at the rate of 90 stools per acre, farmyard manure has increased the coffee yields slightly but it has had no effect on the yields of coffee from plots in which the bananas are at the higher rate per acre.

Pruning Experiments.

From Experiment XIII in which the yields from coffee grown on the single stem system are being compared with those from trees grown on the multiple stem system, eighteen years records are available. Over the whole period trees grown on the multiple stem system have given 22 per cent more coffee than trees grown on the single stem system. This difference in favour of the multiple stem system arises from the very much greater crop borne in the first ten years, in the subsequent years the crop from the single stem system has exceeded that from the multiple stem system.

Table I shows the mean yield in cwt. of clean coffee per acre for these periods.

TABLE I

	Mean 1938–47	Mean 1948–55	Mean 1938–55
Single Stem	5·84	13·10	8·89
Multiple Stem	10·14	11·58	10·78

Armillaria root rot has now made itself apparent in both the single stem and multiple stem plots of one square of this experiment. The other two squares will continue to be recorded and considered as observation plots.

In Experiment XVIIIA and XXI comparisons are also possible between the single and multiple stem pruning systems, and the results of the first three bearing years show that the multiple stem system has out-yielded the single stem system by a very considerable margin. In Experiment XVIIIA this is so in the case of each of the twelve selections used.

In Experiment XXI (comparing methods of establishing the single stem system and methods of establishing the multiple stem system) the plots of single and hitherto uncapped stems were capped at 6 feet and all except the top six pairs of primaries were removed, with the intention of developing an umbrella habit in simulation of the Colombian system. This drastic treatment has obviously rendered the plants ineffective as yielders for the time-being. The primaries remaining developed strongly and set a fair crop for the 1956/57 season.

The highest yielding treatment in Experiment XXI this year is that with three suckers arising from below 10 inches on the mother stem (Treatment C). This cropped at the rate of 16 cwt. per acre, while treatment E (two suckers from the top node of the mother stem) yielded 10·66 cwt. per acre. The two single stem treatments only yielded between 6 and 7 cwt per acre. For the three-year period treatment C has the highest mean yield (10·17 cwt.), treatment E is the second highest (9·52 cwt.) and the highest of the single stem treatments is 8·52 cwt. per acre. The change in order of performance of treatments from year to year in experiments of this sort underlines the need to keep records for a long period before their relative merits can be assessed.

The various pruning treatments were established in Experiment XXII (pruning, irrigation, mulch) It has been interesting to note the diverse growth habits of the different selections planted in this trial. The first crop was recorded this year.

Breeding.

Seed resulting from the crosses made in the 1953/54 season was sown in the nursery, but germination was very poor.

Further crosses were made during the 1954/55 season, but considerable difficulty in synchronization of the flowering was experienced, and fruit set was poor.

Pests and Diseases

White Stem Borer—(*Anthores leuconotus*).—No borers were found in the areas which had been previously sprayed with Dieldrin.

Leaf Rust—(*Hemileia vastatrix*).—Severe infection again occurred on those trees bearing a heavy crop especially on some of the single stem trees in the clonal selection trials (Experiment XVIII), in spite of two routine copper sprayings in February/March and in June respectively. Defoliation was never complete.

Wound Dressing Trials

The results from this preliminary trial became available during the year. The fourteen dressings used were Flintcote emulsion, R.C.O. bituminous paint Sovacote, Shelmac 125, PF4 Shell bituminous paint, Aluminium paint, White lead paint, Flyomac, grafting wax, Mexphalt plus kerosene, wood tar, Bordeaux paste, and Lanolin cream to which hormones had been added.

Callusing only occurred where a clean saw cut had been made, but a satisfactory callus, sufficient to exclude the entry of fungus organisms was not obtained under any treatment, even when hormone substances, designed to assist callusing, were incorporated in the dressings.

R.C.O. bituminous paint appears to offer the best protection from fungus attack. Many of the others were insufficiently persistent to give a water-tight cover. The possibility of using Bordeaux paste followed by a dressing of R.C.O. will be investigated.

Chemist's Report

The Chemist was on vacation leave from 30th April to 29th October and during his absence the laboratory staff carried on with routine analytical work, mostly connected with leaf tissue and soil analyses. During l ave visits were paid by the Chemist to leading Agricultural Research Stations in the United Kingdom; much helpful information being obtained and valuable contacts made. In particular, the pot technique devised by Dr. R. A. Webb, of Long Ashton, for the study of the responses of soils to fertilizers and the *Aspergillus niger* bio-assay technique of Dr. Nicholas, were noted for future use.

The main coffee nutritional investigations which were continued during the year were those involving regular monthly leaf and cherry sampling and analysis in order to study nutritional trends under different conditions and treatments. This was started in August, 1954, and will continue until August, 1956. By analysis of coffee leaf (and cherry, when available) in this way, it is intended to attempt to determine what nutrients are of greatest importance to high yielding.

The results of the first year of the two-year cycle show that in the irrigation and mulch experiment the content of potassium in leaf and cherry from trees which had received banana trash mulch was higher, and the content of calcium lower, than in trees from control plots. Irrigation alone had little effect except for an indication that it had caused an increased potassium uptake during the dry season—as is to be expected. Further data is needed before any comment can be made on the mulch-irrigation interactions. The only other nutrient determined was magnesium, but no statement can yet be made as to the effects on its level.

Using a similar technique, trees in the two stages of the biennial bearing cycle were studied. Two experimental blocks of coffee were used, Kents Plot, and Experiment XVIII. The figures so far available for the former block show a tendency for the content of potassium to be higher and calcium lower, in the leaves of trees preceding the bearing of a heavy crop than in trees preceding a smaller crop. This has not yet been confirmed in the latter block. No significant effects on other nutrients have been recorded as yet.

Over the period June, 1954 to May, 1955, regular monthly samples were received for analysis from an estate near Lushoto in the Usambaras, where the coffee was very low yielding. Soil analysis had shown a high ratio of exchangeable calcium to potassium in the soil, and leaf analysis, compared with samples taken from the Coffee Research Station, showed a consistently lower potassium and higher calcium in the Lushoto coffee leaf than in the Coffee Research Station coffee leaf. The calcium differences were greater than the potassium differences.

The work to date does indicate that the potassium status of coffee might well be a controlling factor in high yielding and a potassium and mulch trial has been superimposed on four latin squares in one of the Station experiments. Leaf

samples are taken monthly from this and will be analysed for uptake of potassium and calcium. Data for calcium content are only relative, of course, because of the effect of Bordeaux sprays in the leaf-calcium level.

Work has also continued on the identification of various leaf chlorotic conditions, suspected as being due to nutrient deficiencies. There has been a certain amount of support from leaf analyses for a chloritic condition of the older leaves as being linked with a low level of magnesium in the leaf and work on this is proceeding. Spraying trials using manganese and zinc sprays have been carried out in the Arusha area and on the Station. On an African plot near the Station, chlorotic conditions, caused probably by iron and manganese deficiencies in the leaf, were treated with sprays containing these, and temporary responses were obtained.

Various miscellaneous soil and irrigation water analyses for advisory purposes were also carried out during the year.

Processing Methods

A coffee washing machine was imported from America. This machine is designed to remove the mucilage of freshly pulped coffee without the necessity of fermentation. Test runs carried out at this Station have shown that this can be done efficiently. The principle of its operation consists of fairly violent agitation of a mass of coffee in the absence of water.

The model tested was found to be insufficiently robust in construction, modification having to be carried out to enable the test programme to be completed. Further, liquoring reports showed that the machine had a consistently adverse effect on quality, the loss of quality amounting to an average of two classes over the fifteen tests carried out. The loss in quality was due to the effect of the machine on several characteristics, three of the most important being as follows:—

1. *Colour*.—Colour was seriously affected, the machine tending to induce dullness. It was also noticeable that machine-washed coffee was much more heavily coated with silverskin than coffee normally fermented.

2. *Flavour*.—Flavour was slightly affected; in two cases a "buni" flavour was reported.

3. *Taint*.—Taint in the form of sourness was significantly increased by the use of the washing machine.

Visible physical damage such as chipping of the parchment could be avoided by careful regulation of the machine.

Test runs at varying speeds of operation, and with various after-treatment of machine-washed coffee have been carried out with a view to improving the quality of the product. These have not been successful.

Trials of chemical methods of removing the mucilage have been continued with the intention of discovering (a) the particular factor in the liquoring classification which in previous season has caused the down grading of chemically washed coffee and (b) whether any process previous to washing or after washing may be modified in such a way that the chemical removal of mucilage can then be carried out without harm to the quality.

The chemical methods tried were:—

1. Washing freshly-pulped coffee in a 1 per cent solution of caustic soda.
2. Washing freshly-pulped coffee in various strengths of hydrochloric acid.

The effect of caustic soda washing was generally to lower the class of the product, although in one or two instances this was not so (the normally fermented control in these instances attained a class 4 or 5). A pre-treatment of the coffee, consisting of allowing it to remain unpulped for 24 hours, did not improve the quality of caustic-soda-washed coffee. An after treatment, allowing the coffee to stand in clean water overnight after washing in caustic soda, appeared to improve the quality slightly, but insufficient samples were available for a conclusive result. The factor causing the down grading is not consistently shown up by the liquoring reports, although it is clear that colour again plays an important part.

Washing with hydrochloric acid was abandoned when it was found that this resulted in a brownish colour of the bean.

Pectic enzyme as a fermentation accelerator was included as a treatment in the above trials. Once again liquoring reports were not sufficiently consistent on which to base any final statement about this method, but in general the quality of the coffee so treated was reduced.

Other methods of accelerating normal fermentation were also investigated. These included inoculation of batches of pulped unfermented coffee with mucilage from fermented coffee, the addition of unfermented mucilage from the washing machine and the use of pulp-water as an accelerator. The pulp-water is rich in the enzymes present in the mesocarp of the fruit, and, of the three methods mentioned it alone showed any promise as an accelerator. The pulp-water appears to attain its greatest effect after storage for over one day and retains its activity for some six or seven days thereafter. In some cases the use of pulp-water completed fermentation in four hours. As much of the work on methods of improvement of fermentation was carried out in the latter half of the 1955 season, fermentation times may be unduly optimistic, and no general statement can yet be made with regard to the consistent effect of pulp-water in this respect. One trial carried out early in the 1956 season showed that fermentation could be carried out overnight by use of this method. Time has not permitted further tests. Liquoring quality of coffee so fermented was not favourable when compared with the normally fermented control. As the general standard of the coffee tested was never better than Class 4 and more commonly round Class 6 to Class 7, it cannot be said to have had a critical test.

There is no doubt that high yielding plant material is now available, but the high degree of biennial bearing that occurs clearly indicates that the rate of availability of the necessary nutrients is the limiting factor to production at a high level each and every year.

At the time of flowering for the "on" year the nutritional status of the tree is high as a result of the accumulation of reserves during the "off" year immediately previously. The fact that an "off" year follows the "on" year implies that the rate of uptake of nutrients during the "on" year is not at the rate necessary to maintain the nutritional status of the tree at the level which existed at the time of flowering for the "on" year crop.

That it is possible to maintain the nutritional level necessary for heavy cropping is shown by the yields obtained in some of the squares in Experiment XVIII for the years 1949, 1950 and 1951. For example, in Square I, the yields

for these three seasons were at the rate of 15·7 cwt., 14·8 cwt. and 17·24 cwt. per acre respectively. The yield in the 1952 season, however, was much smaller at 2·85 cwt. per acre.

The degree of biennial bearing in the years 1949, 1950 and 1951 was small, but it was marked for the years 1951 and 1952. This implies that the current intake from the time of flowering for the 1949 crop to the time of flowering for the 1951 crop was sufficiently high to maintain the reserves at approximately the same level as they were at the time of flowering for the 1949 crop. The very much lower yield obtained in 1952 indicates that the 1951 crop was produced largely on reserves, the rate of uptake of nutrients during the production of the 1951 crop being insufficient to maintain the reserves at the requisite level.

That it is possible to increase the rate of uptake of the required nutrients is shown by the increases in crop arising from irrigation and mulch when applied singly. A still further increase in the rate of uptake is shown by the fact that a combination of irrigation and mulch results in a further rise in yield.

The problem now is to ascertain the levels of the various nutrients necessary for high yielding and to find means of maintaining these levels in the tree. It is to this end that work is now being directed.

Visitors

Visitors to the Station during the year included the Member for Agriculture and Natural Resources; the Director of Agriculture; the Deputy Director of Agriculture; Dr. C. C. Webster, Chief Research Officer, Department of Agriculture, Kenya; Mr. Coste from the Office de la Recherche Scientifique, Paris; the Chemist and Entomologist from the Coffee Research Station, Kenya; delegates attending the Co-operative Course in Moshi; students from local schools; parties from co-operative societies in Tanganyika, Uganda and Kenya, and various planters and representatives of commercial firms.

Coffee Research Station,
Lyamungu, Moshi
September, 1956

F. R. Sanders,
Senior Research Officer

DETAILS AND RECORDS OF EXPERIMENTS

Unless otherwise stated, an out-turn figure of sixteen per cent has been used when converting weights of cherry to their equivalent in clean coffee.

A difference between any two treatments greater than the figure given as "significant difference" can be considered as being due to the particular treatment. Unless otherwise stated, the figure for significant difference is at the level of probability of P=0·05; at this level of probability the chances against drawing the wrong conclusion by using the significant difference figure are nineteen to one. In all tables the following abbreviations are used:—

S.E.=Standard Error.

Sig. Diff.=Significant Difference.

SELECTION TRIALS ON THE STATION

EXPERIMENT XVIII—CLONAL SELECTION TRIALS

These trials consist of a series of 6 × 6 Latin Squares, wherein the yields of rooted cuttings of potential selections are compared. Planting commenced in April, 1943; additional squares have been planted up subsequently, as material became available. All squares planted prior to April, 1944 (eight in number) have been pruned on the single stem system; those planted subsequently have been grown on multiple stem. Each square is planted with the following shade trees, so that each of six plots of any one clone has a different semi-permanent shade tree:—

Semi-permanent:—

Albizzia moluccana
Albizzia stipulata
Albizzia sp. ("Tangasale")
Cordia holstii
Ficus sycamorus
Maesopsis eminii

Permanent:—

Albizzia maranguensis

EXPERIMENT XVIII—LATIN SQUARE I.—PLANTED 29.4.43—SINGLE STEM YIELDS CALCULATED AS CWT. CLEAN COFFEE PER ACRE

	Mean of 4 years 1945–48	Mean of 6 years 1949–54	1955	Mean of 11 years 1945–55	
				Cwt.	Percentages
N 39	5·55	11·57	27·09	10·79	95
R 23	3·89	11·68	31·18	10·62	93
N 71	4·19	11·56	33·87	10·90	96
I 60...	5·41	13·51	30·21	12·16	107
M 2...	4·82	12·30	28·68	11·07	97
L 1	5·01	14·21	35·87	12·84	113
Mean	4·81	12·47	31·15	11·39	100
S.E....	0·21	0·28	1·45	0·22	2
Sig. Diff.	0·63	0·83	4·27	0·65	6

EXPERIMENT XVIII—LATIN SQUARE II.—PLANTED 30.4.43—SINGLE STEM YIELDS CALCULATED AS CWT. CLEAN COFFEE PER ACRE

	Mean of 4 years 1945–48	Mean of 6 years 1949–54	1955	Mean of 11 years 1945–55	
				Cwt.	Percentages
N 20	3·86	12·15	24·42	10·25	96
N 30	3·83	11·54	21·76	9·67	91
N 29	4·84	12·22	21·54	10·38	97
N 5...	5·05	12·08	21·11	10·34	97
N 48	4·01	12·43	29·81	10·94	103
N 197	6·29	13·71	28·17	12·33	116
Mean	4·65	12·36	24·47	10·65	100
S.E....	0·29	0·32	1·32	0·28	3
Sig. Diff.	0·85	0·93	3·89	0·83	8

EXPERIMENT XVIII—LATIN SQUARE III.—PLANTED 26.10.44—MULTIPLE STEM YIELDS CALCULATED AS CWT. CLEAN COFFEE PER ACRE

	1947	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 9 years 1947–55	
										Cwt.	Percentages
N 5	*6·26	11·42	14·39	11·88	10·87	6·81	24·09	1·00	17·02	11·52	90
AB 35 ...	4·56	11·60	11·63	13·79	11·84	5·45	23·91	1·26	24·42	12·06	94
KP 154 ...	3·25	13·40	15·33	19·98	9·55	7·64	28·51	6·56	25·17	14·37	112
KP 423 ...	6·82	13·48	14·11	26·18	12·55	8·90	33·48	9·94	22·56	16·45	128
M 97 ...	5·51	10·51	10·99	9·29	8·66	5·29	31·62	1·53	20·97	11·60	90
N 106 ...	5·79	8·10	10·24	10·12	7·51	5·45	27·53	1·46	23·53	11·08	86
Mean ...	5·37	11·42	12·78	15·20	10·16	6·59	28·19	3·62	22·28	12·84	100
S.E.	–	0·62	0·93	1·36	1·15	0·63	1·49	0·45	1·58	0·37	3
Sig. Diff. ...	–	1·84	2·73	4·01	3·39	1·85	4·40	1·33	4·67	1·11	9

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE V.—PLANTED 14.4.49—MULTIPLE STEM YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1951*	1952*	1953*	1954*	1955*	Mean of 5 years 1951–55	
						Cwt.	Percentages
L 1	3·57	7·80	16·63	12·48	15·38	11·17	98
X 208	3·13	9·02	21·05	11·86	19·67	12·95	113
U 329	3·19	8·29	17·93	9·62	16·13	11·03	97
Q 89	3·14	8·59	12·48	14·98	12·75	10·39	91
X 216	3·57	9·28	19·85	11·61	18·18	12·49	109
AB 37	2·81	8·34	12·12	14·20	15·00	10·49	92
Mean	3·24	8·55	16·68	12·45	16·18	11·42	100
S.E.	0·44	0·64	1·48	0·96	1·36	0·57	5
Sig. Diff.	—	—	4·38	2·85	4·01	1·70	15

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE VI.—PLANTED 15.4.49—MULTIPLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1951*	1952*	1953*	1954*	1955*	Mean of 5 years 1951–55	
						Cwt.	Percentages
N 39	4·16	8·77	25·59	7·36	20·62	13·30	120
N 219	2·73	7·50	13·82	9·58	17·12	10·15	92
X 125	2·46	7·83	19·10	7·38	19·78	11·31	102
KP 146	2·64	7·78	18·46	8·32	18·50	11·15	101
X 297	3·06	9·02	19·58	9·45	18·56	11·93	108
I 89	1·64	5·14	13·10	8·54	14·91	8·67	78
Mean	2·78	7·67	18·28	8·44	18·25	11·08	100
S.E.	0·55	0·87	1·39	1·05	1·59	0·63	6
Sig. Diff.	—	—	4·09	—	—	1·85	17

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE VII.—PLANTED 7.6.43—SINGLE STEM YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	Mean of 4 years 1945–48	Mean of 6 years 1949–54*	1955*	Mean of 11 years 1945–55	
				Cwt.	Percentages
R 15	5·05	12·37	28·11	11·14	103
N 81	6·44	12·86	28·20	11·92	110
KP 228...	6·50	14·60	22·21	12·35	114
I 49	3·89	11·14	28·02	10·04	93
S 16	3·72	9·63	25·08	8·88	82
N 34	3·86	11·92	18·66	10·51	97
Mean	4·91	12·08	26·71	10·80	100
S.E.	0·34	0·41	1·36	0·34	3
Sig. Diff.	1·01	1·21	4·02	1·02	9

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE VIII.—PLANTED 13.8.43—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	Mean of 4 years 1945–48	Mean of 6 years 1949–54*	1955*	Mean of 11 years 1945–55	
				Cwt.	Percentages
R 2	5·49	11·99	26·67	10·96	94
H 66	8·51	16·20	28·18	14·50	125
M 7	4·54	11·13	27·98	10·26	88
AB 92	4·48	11·84	24·15	10·28	88
N 218	5·59	12·78	28·18	11·56	99
N 100	5·73	13·79	29·26	12·26	105
Mean	5·72	12·96	27·40	11·64	100
S.E.	0·36	0·33	1·74	0·29	2
Sig. Diff.	1·06	0·95	—	0·87	7

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE IX.—PLANTED 20.12.43—SINGLE STEM YIELDS CALULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1946	1947	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 10 yrs. 1946–55	
											Cwt.	Percentages
AC 98	4·07	9·54	4·24	14·07	11·42	10·88	6·39	15·65	2·38	25·56	10·42	92
R 3	5·22	10·12	1·70	18·43	6·54	14·81	3·50	19·31	1·50	25·72	10·69	94
KP 683	4·46	13·63	4·78	14·54	8·33	12·09	6·83	21·61	5·84	21·35	11·34	100
N 205	6·60	13·02	3·10	18·30	10·73	16·03	5·90	22·29	2·43	29·67	12·81	113
N 128	4·87	12·91	1·75	17·37	5·02	16·37	3·77	29·11	0·87	24·24	11·62	102
I 5	4·58	10·39	2·87	17·52	7·83	15·57	3·98	22·74	1·39	27·34	11·42	100
Mean	4·96	11·60	3·07	16·71	8·31	14·29	5·06	21·79	2·40	25·64	11·38	100
S.E.	–	–	0·51	1·36	1·26	0·86	0·63	0·73	0·44	1·42	0·27	2
Sig. Diff.... ...	–	–	1·40	–	3·72	2·53	1·85	2·17	1·31	4·20	0·80	7

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE X.—PLANTED 29.12.43—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1946	1947	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 10 yrs. 1946–55	
											Cwt.	Percentages
N 110	4·79	12·99	3·02	11·45	11·03	10·48	10·98	27·27	3·82	26·01	12·18	98
M 95	4·13	11·16	0·93	13·22	13·25	7·58	6·09	19·27	1·58	24·72	10·19	82
KP 532	5·36	16·03	8·32	14·84	15·50	17·01	12·42	27·49	8·79	21·92	14·77	119
N 197	9·50	*13·70	3·13	17·31	16·02	10·79	10·73	20·59	1·18	29·67	13·27	107
I 235	5·15	12·05	2·38	15·73	15·55	12·08	5·95	20·48	1·69	28·22	11·92	96
R 11	5·18	11·14	1·62	16·45	11·97	12·24	6·29	26·36	0·72	29·50	12·14	98
Mean	5·69	12·85	3·24	14·83	13·89	11·69	8·74	23·57	2·96	26·68	12·41	100
S.E.	–	–	0·64	0·85	1·63	1·10	1·09	1·09	0·61	1·17	0·34	3
Sig. Diff.... ...	–	–	1·90	2·50	–	3·24	3·21	3·21	1·80	3·44	0·99	8

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE XI.—PLANTED 16.4.46—MULTIPLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 8 years 1948–55	
									Cwt.	Percentages
KI 363	3·01	16·34	13·92	15·10	4·87	26·41	3·63	23·64	13·36	118
N 197	1·18	10·91	14·93	6·05	4·53	21·11	2·03	20·57	10·16	89
N 100	1·80	12·88	17·65	8·20	4·68	21·04	1·89	19·24	10·93	96
R 3	1·20	10·68	12·21	6·81	4·73	21·99	2·36	18·83	9·85	87
N 5	1·67	18·14	12·99	10·23	7·33	24·69	2·63	22·51	12·52	110
N 39	1·08	14·56	12·53	12·43	4·54	22·20	2·81	20·77	11·36	100
Mean	1·66	13·91	14·04	9·80	5·12	22·91	2·56	20·93	11·37	100
S.E.	0·21	0·91	1·18	0·89	0·76	0·95	0·57	1·41	0·43	4
Sig. Diff.	0·61	2·69	3·48	2·63	–	2·82	1·66	–	1·28	11

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE XII.—PLANTED 16.4.46—MULTIPLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 8 years 1948–55	
									Cwt.	Percentages
KP 227...	3·16	17·89	18·65	11·00	6·05	22·94	7·69	22·19	13·70	113
N 181	3·50	17·94	11·20	7·69	7·45	20·00	2·68	21·63	11·51	95
N 100	3·29	13·93	16·20	6·14	4·37	23·97	3·15	19·99	11·38	94
R 24	1·76	11·99	16·40	5·08	5·82	26·43	3·77	20·40	11·46	95
KP 231...	0·89	12·41	19·24	8·97	4·50	17·57	6·80	23·56	11·74	97
KP 163...	3·32	18·53	17·77	8·42	5·39	23·79	5·95	18·41	12·69	105
Mean	2·65	15·45	16·57	7·88	5·60	22·45	5·00	21·03	12·08	100
S.E.	0·55	1·15	1·15	0·81	0·63	1·48	0·77	1·25	0·49	4
Sig. Diff.	1·62	3·39	3·38	2·40	1·85	4·36	2·27	–	1·46	12

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE XIII

PLANTED { GROUP 1: 26.4.46 / GROUP 2: 20.5.47 } MULTIPLE STEM

YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	Clone	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean
GROUP 1	X 321	2·71	13·69	17·86	12·63	8·57	25·41	5·85	22·32	13·63
	AC 189	3·49	7·71	13·12	6·97	4·56	22·03	2·42	19·96	10·03
	N 100	0·79	8·60	19·21	6·32	4·45	21·61	1·78	19·07	10·23
GROUP 2	R 15	–	–	9·86	8·88	6·55	19·12	1·71	14·67	10·13
	KP 162	–	–	10·40	12·15	7·82	26·81	6·48	20·40	14·01
	AC 98	–	–	11·56	9·71	5·59	16·62	1·42	19·77	10·78

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE XIV.—PLANTED 21.5.47—MULTIPLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 7 years 1949–55	
								Cwt.	Percentages
R 3...	0·38	6·56	10·38	5·15	19·52	1·40	17·15	8·57	86
N 50	0·57	6·44	7·40	4·76	19·29	1·41	15·53	7·91	79
H 1	0·49	5·92	14·73	8·54	23·56	1·77	19·42	10·63	107
AC 53	0·42	8·52	11·96	5·55	21·50	1·26	17·72	9·55	96
N 110	0·58	8·59	15·29	6·00	21·39	1·53	18·76	10·31	104
KIL 10	0·46	6·31	19·45	10·28	26·59	2·32	23·79	12·74	128
Mean	0·49	7·06	13·20	6·72	21·97	1·61	18·73	9·95	100
S.E.	0·13	0·92	1·15	0·85	1·03	0·32	1·81	0·57	6
Sig. Diff.	–	–	3·39	2·50	3·05	–	5·35	1·70	17

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE XV.—PLANTED 26.1.44—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1946	1947	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 10 yrs. 1946–55	
											Cwt.	Percentages
AB 11	1·63	12·63	2·61	11·99	9·55	5·56	7·81	13·42	4·09	19·15	8·85	93
N 50	0·82	9·82	1·72	13·88	7·34	6·55	9·93	17·70	4·43	18·37	9·05	95
L 1	1·17	13·66	2·74	13·52	6·69	8·09	11·80	19·29	5·27	27·78	11·00	116
KP 263	1·54	9·62	6·38	8·29	11·60	4·43	16·86	12·11	15·03	13·85	9·99	105
I 47	1·23	10·73	2·23	12·31	5·88	7·82	7·90	17·81	4·15	21·72	9·17	96
N 215	1·95	9·97	1·79	11·91	5·81	8·56	7·85	17·81	4·12	20·86	9·06	95
Mean	1·39	11·07	2·91	11·99	7·81	6·83	10·36	16·35	6·18	20·29	9·52	100
S.E.	–	–	0·61	1·00	1·00	0·75	1·17	0·72	0·65	1·51	0·31	3
Sig. Diff.... ...	–	–	1·79	2·94	2·96	2·22	3·44	2·14	1·93	4·45	0·91	10

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE XVI.—PLANTED 3.3.44—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1946	1947	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 10 yrs. 1946–55	
											Cwt.	Percentages
N 198	0·72	7·93	2·67	13·30	11·44	11·66	6·07	21·89	1·93	32·91	11·05	100
R 3	0·66	7·88	0·87	13·23	10·90	11·89	7·22	23·11	1·76	30·56	10·81	98
R 25	0·66	7·04	2·01	11·49	9·96	12·59	5·92	21·33	1·87	29·36	10·24	93
N 76	0·83	8·85	3·89	13·77	14·09	10·74	7·82	21·67	1·04	24·25	10·70	97
N 220	0·86	4·85	2·87	10·52	9·88	11·04	5·39	20·35	1·47	31·80	9·91	90
N 197	1·33	*9·29	5·34	17·66	19·68	13·76	8·09	25·08	1·54	32·63	13·44	122
Mean	0·85	7·64	2·94	13·23	12·66	11·95	6·75	22·24	1·60	30·26	11·02	100
S.E.	–	–	0·60	0·70	0·87	0·54	0·74	1·26	0·27	1·69	0·27	2
Sig. Diff.... ...	–	–	1·78	2·08	2·57	1·59	2·19	–	–	4·98	0·80	7

*Using actual out-turn.

EXPERIMENT XVIII—LATIN SQUARE XVII.—PLANTED 13.9.45—MULTIPLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1948*	1949*	1950*	1951*	1952*	1953*	1954*	1955*	Mean of 8 years 1948–55	
									Cwt.	Percentages
KP 162...	6·76	17·91	24·94	12·45	6·62	24·69	11·98	20·14	15·68	134
N 34	7·20	15·79	19·37	7·73	6·39	19·18	2·72	21·24	12·45	107
N 14	1·90	8·89	11·44	7·65	6·59	21·81	2·47	16·38	9·64	83
I 56	4·84	11·81	15·35	6·40	8·52	21·77	0·95	18·19	10·98	94
R 3	4·99	11·86	12·89	6·21	6·37	19·03	2·05	16·91	10·04	86
F 502	6·05	9·94	16·54	6·35	3·46	20·99	1·31	24·77	11·16	96
Mean	5·29	12·70	16·75	7·80	6·33	21·25	3·58	19·60	11·66	100
S.E.	0·91	1·05	1·09	1·03	0·70	1·83	0·66	1·34	0·48	4
Sig. Diff.	2·67	3·10	3·33	3·02	2·06	–	1·95	3·96	1·41	12

*Using actual out-turn.

EXPERIMENT XVIIIA—CLONAL SELECTION TRIALS

These two 6× 6 Latin Squares are an extension of Experiment XVIII. In addition to the testing of rooted cuttings of selections, each plot is split to compare single and multiple stem systems of pruning.

EXPERIMENT XVIIIA—LATIN SQUARE XVIII.—PLANTED APRIL 1951
YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

		KP 262	R 1	Q 73	N 101	F 840	N 39	Mean	S.E.	Sig. Diff.
1953*	Single Stem	6·68	4·16	5·07	3·50	7·94	6·73	5·68	0·32	—
	Multiple Stem ...	7·17	5·08	5·07	3·58	8·75	5·61	5·88		
	Main Plot	6·92	4·62	5·07	3·54	8·34	6·17	5·78	0·31	0·92
1954*	Single Stem	8·45	4·51	6·70	4·46	7·69	6·90	6·45	0·83	2·38
	Multiple Stem ...	15·11	15·20	14·43	13·75	14·74	15·85	14·85		
	Main Plot	11·78	9·85	10·57	9·11	11·22	11·38	10·65	0·50	—
1955*	Single Stem	11·87	9·49	8·95	8·34	10·55	8·24	9·57	0·57	1·65
	Multiple Stem ...	16·23	12·85	9·33	10·12	17·22	15·85	13·60		
	Main Plot	14·05	11·16	9·15	9·23	13·88	12·05	11·59	1·12	3·29
Mean of 3 years 1953–55	Single Stem	9·00	6·06	6·91	5·43	8·73	7·28	7·24	0·29	0·85
	Multiple Stem ...	12·83	11·04	9·62	9·16	13·57	12·43	11·44		
	Main Plot	10·93	8·54	8·26	7·30	11·15	9·86	9·33	0·86	2·55

*Using actual out-turn.

EXPERIMENT XVIIIA—LATIN SQUARE XIX.—PLANTED APRIL 1951
YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

		AC 83	N 229	H 61	R 12	KP 265	R 3	Mean	S.E.	Sig. Diff.
1953*	Single Stem	5·86	6·10	7·99	6·76	8·45	6·05	6·87	0·17	—
	Multiple Stem ...	5·97	6·00	7·85	6·00	8·14	6·72	6·78		
	Main Plots	5·92	6·05	7·92	6·38	8·30	6·39	6·83	0·27	0·80
1954*	Single Stem	8·08	7·18	8·11	7·31	8·11	8·12	7·81	0·42	1·23
	Multiple Stem ...	18·22	17·56	19·91	17·58	18·04	18·17	18·26		
	Main Plots	13·15	12·38	14·02	12·45	13·08	13·15	13·04	0·48	—
1955*	Single Stem	8·53	10·67	11·55	11·16	15·95	9·10	11·16	0·42	1·24
	Multiple Stem ...	12·17	11·86	15·70	12·38	18·34	12·50	13·82		
	Main Plots	10·35	11·26	13·62	11·77	17·15	10·80	12·49	0·85	2·51
Mean of 3 years 1953–55	Single Stem	7·48	7·98	9·22	8·42	10·83	7·76	8·62	0·19	0·53
	Multiple Stem ...	12·13	11·81	14·48	12·00	14·84	12·47	12·95		
	Main Plots	9·81	9·89	11·84	10·21	12·83	10·11	10·78	0·42	1·24

*Using actual out-turn.

EXPERIMENT IV—SQUARES II, V, AND IX.—CLONAL SELECTION TRIALS

The three original squares in Experiment IV were uprooted, because of the unsuitability of the various exotic coffees planted therein. As material became available, they were each replanted with the same five clones, Squares II and V being grown on the single stem system and Square IX on multiple stem. The spacing is 8 feet × 8 feet apart.

The results have been disappointing, probably due to the heavy shade, prior to 1948, of *Acrocarpus fraxinifolius*, *Cordia holstii*, and *Albizzia maranguensis*, and the previous existence of coffee in the area.

EXPERIMENT IV—LATIN SQUARE II.—PLANTED 13.4.43—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Selection	Mean of 4 years 1945–48	Mean of 6 years 1949–54	1955	Mean of 11 years 1945–55	
				Cwt.	Percentages
N 39	1·90	8·23	21·88	7·17	98
R 3	1·83	7·54	15·07	6·15	84
L 1	2·48	9·54	24·19	8·31	113
N 100...	2·19	8·43	18·90	7·11	97
N 197...	2·50	9·13	23·83	8·06	110
Mean	2·18	8·57	20·78	7·35	100
S.E.	0·10	0·25	1·11	0·19	3
Sig. Diff.	0·30	0·77	3·42	0·59	8

EXPERIMENT IV—LATIN SQUARE V.—PLANTED 9.4.42—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Selection	Mean of 4 years 1945–48	Mean of 6 years 1949–54	1955	Mean of 11 years 1945–55	
				Cwt.	Percentages
N 39	2·78	8·73	19·02	7·50	96
R 3	3·15	8·21	17·56	7·21	92
L 1	3·41	9·47	20·94	8·31	106
N 100...	3·07	9·12	16·40	7·59	97
N 197...	3·90	9·62	21·26	8·60	110
Mean	3·26	9·03	19·03	7·84	100
S.E.	0·14	0·37	1·03	0·21	3
Sig. Diff.	0·44	—	3·16	0·64	8

EXPERIMENT IV—LATIN SQUARE IX.—PLANTED 17.3.44—MULTIPLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1948*	1949*	1950*	1951*	1952*	1953†	1954†	1955	Mean of 8 years 1948–1955	
									Cwt.	Percentages
N 39	2·19	11·30	4·05	12·61	2·61	12·44	1·70	13·42	7·54	108
R 3	2·34	7·18	6·22	10·10	1·95	10·13	1·39	10·60	6·24	90
L 1	1·94	7·09	7·71	8·35	3·71	11·25	1·75	11·89	6·71	96
N 100	2·61	9·30	7·03	8·60	2·10	11·25	1·69	9·97	6·56	94
N 197	2·86	10·08	7·78	9·35	3·82	12·95	1·88	13·38	7·76	111
Mean	2·39	8·99	6·55	9·77	2·84	11·60	1·69	11·87	6·96	100
S.E.	0·440	1·06	0·65	1·15	0·33	0·64	0·33	0·95	0·32	5
Sig. Diff.	–	–	1·99	–	1·00	–	–	–	0·98	14

*Using actual out-turn. †Using random sample.

EXTERNAL SELECTION TRIALS

As a logical sequence to the selection trials on the Station, further trials were laid down in the coffee growing districts with the object of ascertaining the most suitable selections for the different conditions of climate and soil. Since the end of 1946, thirty clonal selection trials, embracing fourteen different estates or holdings, have been laid down. Considerable difficulty in establishing and maintaining these trials was unfortunately experienced. Eight trials on five estates had to be abandoned completely while only fourteen, embracing seven estates or holdings are being entirely maintained and recorded at the present time.

Annual and mean yields, together with a summary of the particular conditions of each trial, are given below.

EXPERIMENT COS/XI

Location—Arusha
Altitude—4,200 feet
Lay-out—6 × 6 Latin square
Planted—31.3.50
Pruning—Multiple stem
Shade—Scattered and irregular *Grevillea robusta* (established)

YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1953	1954	1955	Mean of 3 years 1953–1955	
				Cwt.	Percentages
N 50	2·17	8·69	3·29	4·72	106
N 218...	1·41	9·16	2·73	4·43	99
N 197...	1·92	10·36	3·33	5·21	117
N 29	1·99	8·77	2·03	4·26	95
N 14	1·61	9·81	2·09	4·51	101
R 23	1·24	6·21	3·67	3·70	83
Mean	1·72	8·83	2·85	4·47	100
S.E.	0·26	0·79	0·34	0·35	8
Sig. Diff.	—	2·33	0·99	—	—

EXPERIMENT COS/XXX

Location—Arusha
Altitude—4,200 feet
Lay-out—25 × 24 Lattice square. Blocks paired for comparison of Multiple and Single stem.
Planted—2.5.52
Pruning—Multiple and Single stem systems
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—*Cordia holstii*

YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Selections	1954			1955			Mean of 2 years 1954–1955		
	Single Stem	Multiple Stem	Mean	Single Stem	Multiple Stem	Mean	Single Stem	Multiple Stem	Mean
N 39	4·67	4·03	4·35	1·48	0·53	0·95	3·08	2·33	2·71
KP 683	2·76	1·70	2·23	2·65	3·61	3·08	2·65	2·65	2·65
N 217	2·55	2·02	2·29	1·80	2·97	2·33	2·23	2·44	2·34
I 56	3·08	3·18	3·13	4·03	2·44	3·29	3·61	2·86	3·24
KP 162	2·44	2·33	2·39	2·97	1·38	2·12	2·76	1·80	2·28
X 125	2·97	3·50	3·24	2·65	2·02	2·33	2·86	2·76	2·81
N 18	1·91	2·12	2·02	1·91	2·65	2·23	1·91	2·44	2·18
H 66	3·08	2·65	2·87	1·91	1·17	1·48	2·55	1·91	2·23
N 182	3·18	1·70	2·44	2·23	1·48	1·80	2·23	1·59	1·91
AC 31	3·08	1·48	2·28	1·38	1·38	1·38	1·80	1·48	1·64
AB 12	3·39	2·86	3·13	2·86	2·02	2·44	3·18	2·44	2·81
I 5	2·02	2·23	2·13	3·71	3·71	3·71	2·86	2·97	2·92
N 5	2·76	3·08	2·92	3·61	0·95	2·23	3·18	2·02	2·60
KP 423	1·91	2·76	2·34	4·03	4·24	4·14	2·97	3·50	3·24
N 197	2·86	2·44	2·65	3·08	2·76	2·86	2·97	2·65	2·81
N 205	3·50	3·18	3·34	3·50	1·48	2·55	3·61	2·33	2·97
I 60	1·48	1·48	1·48	2·33	2·23	2·23	1·91	1·80	1·86
N 33	3·29	3·18	3·24	4·14	4·56	4·35	3·71	3·92	3·82
H 61	2·44	2·02	2·23	2·86	3·08	2·97	2·65	2·55	2·60
KP 231	2·86	2·44	2·65	2·33	2·23	2·33	2·65	2·33	2·49
N 80	4·45	3·39	3·92	0·74	1·80	1·27	2·65	2·65	2·65
F 840/4	2·65	2·33	2·49	3·39	2·55	2·97	3·08	2·55	2·82
R 3	3·18	2·76	2·97	1·48	2·12	1·80	2·33	2·44	2·39
N 71	2·76	3·29	3·03	1·48	2·44	2·02	2·12	2·86	2·49
S 10	2·44	2·44	2·44	2·76	1·17	2·02	2·65	1·91	2·28
Mean	2·87	2·58	2·73	2·65	2·23	2·44	2·73	2·45	2·59
S.E.	0·15		0·32	0·32		0·53	0·21		0·32
Sig. Diff.	—		0·95	—		1·48	—		0·85

EXPERIMENT COS/IV

Location—Kibosho
Altitude—3,800 feet
Lay-out—6 × 6 Latin square
Planted—30.6.47
Pruning—Multiple stem
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—*Leucaena glauca, Cordia holstii*

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1951	1952	1953	1954	1955	Mean of 5 years 1951–1955	
						Cwt.	Percentages
M 97	4·62	0·79	7·99	7·72	17·96	7·82	128
S 16	2·82	0·08	6·63	3·86	13·89	5·46	90
M 95	2·77	0·21	4·50	4·40	16·39	5·66	93
N 106	2·31	0·18	6·07	4·89	15·48	5·79	95
N 197	2·04	0·32	5·51	7·08	15·78	6·15	101
N 34	1·17	0·12	6·65	6·25	14·55	5·75	94
Mean	2·62	0·28	6·23	5·70	15·68	6·10	100
S.E.	0·44	0·11	0·55	0·45	1·41	0·44	7
Sig. Diff.	1·29	0·32	1·62	1·33	—	1·29	22

EXPERIMENT COS/XII

Location—Kibosho
Altitude—3,800 feet
Lay-out—6 × 6 Latin square
Planted—21.4.49
Pruning—Multiple stem
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—*Leucaena glauca, Cordia holstii*

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1951	1952	1953	1954	1955	Mean of 5 years 1951–1955	
						Cwt.	Percentages
X 321	1·22	3·48	10·01	8·95	8·97	6·53	122
L 1	1·10	0·39	6·67	6·38	9·46	4·80	89
R 24	1·10	0·93	8·21	5·03	12·43	5·54	103
KP 228	1·05	2·29	11·90	7·43	10·68	6·67	124
N 128	0·73	0·82	6·96	6·03	10·13	4·94	92
AC 53	0·36	0·40	4·70	5·22	8·14	3·76	70
Mean	0·93	1·39	8·08	6·51	9·97	5·37	100
S.E.	0·16	0·36	0·54	0·48	0·87	0·27	5
Sig. Diff.	0·47	1·06	1·60	1·41	2·57	0·81	15

EXPERIMENT COS/XVII

Location—Kibosho
Altitude—3,800 feet
Lay-out—6 × 6 Latin square
Planted—6.4.50
Pruning—Multiple stem
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—*Leucaena glauca, Cordia holstii*

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1952	1953	1954	1955	Mean of 4 years 1952–1954	
					Cwt.	Percentages
N 29	0·16	7·26	11·13	8·32	6·72	97
N 39	0·29	9·94	10·68	8·84	7·43	107
N 18	0·15	6·30	11·24	5·32	5·75	83
N 218	0·30	9·30	11·83	7·43	7·21	104
R 15	0·17	7·74	9·81	0·44	5·54	80
X 125	0·96	12·17	11·35	11·47	8·99	130
Mean	0·34	8·78	11·01	7·63	6·94	100
S.E.	0·14	3·73	0·64	0·72	0·26	4
Sig. Diff....	0·41	—	—	2·11	0·76	11

EXPERIMENT COS/XVIII

Location—Kibosho
Altitude—3,800 feet
Lay-out—6 × 6 Latin square
Planted—12.4.50
Pruning—Multiple stem
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—*Leucaena glauca, Cordia holstii*

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1952	1953	1954	1955	Mean of 4 years 1952–1955	
					Cwt.	Percentages
N 14	0·08	4·06	9·33	5·05	4·62	90
N 71	0·07	5·02	10·49	3·31	4·72	92
AB 11	0·14	6·20	11·50	3·70	5·38	104
H 61	0·45	6·77	9·89	7·37	6·12	119
N 100	0·05	5·36	11·94	3·18	5·14	100
R 23	0·08	4·18	11·23	4·38	4·97	96
Mean	0·15	5·26	10·73	4·50	5·16	100
S.E.	0·05	0·18	0·61	0·72	0·29	6
Sig. Diff....	0·15	0·55	—	2·11	0·86	17

EXPERIMENT COS/XIX

Location—Kirua Vunjo
Altitude—5,500 feet
Lay-out—6 × 6 Latin square
Planted—19.4.50
Pruning—Multiple stem
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—*Cordia holstii, Leucaena glauca*

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1952	1953	1954	1955	Mean of 4 years 1952–1955	
					Cwt.	Percentages
KP 163	1·00	7·49	8·18	4·23	5·22	128
N 218	2·39	4·67	6·34	4·03	4·36	107
N 197	1·60	8·98	7·70	3·88	5·54	135
N 29	0·65	3·27	5·93	2·52	3·09	76
N 14	1·19	2·40	4·64	4·13	3·09	76
R 15	0·56	3·20	5·49	3·72	3·24	79
Mean	1·23	5·00	6·38	3·75	4·09	100
S.E.	0·25	0·72	0·95	0·32	0·41	10
Sig. Diff....	0·75	2·13	—	0·95	1·20	29

EXPERIMENT COS/XXI

Location—Marangu
Altitude—3,750 feet
Lay-out—6 × 6 Latin square with split plots for comparison of Multiple and Single stem
Planted—3.4.51
Pruning—Split for Multiple and Single stem systems
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—Bananas; Hedges of *Leucaena glauca* between each plot.

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1954			1955			Mean of 2 years 1954–1955		
	Sub-Plots		Main Plots	Sub-Plots		Main Plots	Sub-Plots		Main Plots
	Single Stem	Multiple Stem		Single Stem	Multiple Stem		Single Stem	Multiple Stem	
F 840	2·46	4·08	3·27	2·99	4·25	3·62	2·72	4·17	3·45
N 71	1·16	1·94	1·55	3·42	6·70	5·06	2·29	4·33	3·31
R 23	1·22	1·65	1·44	2·27	6·35	4·32	1·75	4·00	2·88
N 50	0·80	1·61	1·21	1·60	4·20	2·90	1·20	2·91	2·06
R 3	1·59	1·66	1·63	2·45	4·71	3·58	2·02	3·19	2·60
KP 154	0·68	1·98	1·33	2·78	8·43	5·60	1·74	5·20	3·46
Mean	1·32	2·15	1·74	2·59	5·77	4·18	1·95	3·96	2·96
S.E.	0·11		0·35	0·31		0·65	0·18		0·46
Sig. Diff.	0·32		1·02	0·88		—	0·53		—

EXPERIMENT COS/XXII

Location—Marangu
Altitude—3,750 feet
Lay-out—6 × 6 Latin square with split plots for comparison of Multiple and Single stem
Planted—3.4.51
Pruning—Split for Multiple and Single stem systems
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—Bananas; Hedges of *Leucaena glauca* between each plot.

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1954			1955			Mean of 2 years 1954–1955		
	Sub-Plots		Main Plots	Sub-Plots		Main Plots	Sub-Plots		Main Plots
	Single Stem	Multiple Stem		Single Stem	Multiple Stem		Single Stem	Multiple Stem	
KP 163	5·51	7·97	6·74	2·16	7·15	4·66	3·84	7·56	5·71
R 15	1·85	2·87	2·36	1·44	4·64	3·04	1·65	3·75	2·70
F 502	0·46	1·39	0·93	0·84	3·66	2·25	0·65	2·53	1·59
N 29	4·12	5·90	5·01	2·46	7·27	4·86	3·29	6·59	4·94
N 100	3·37	6·74	5·06	2·48	8·16	5·32	2·93	7·46	5·19
AB 37	4·06	7·06	5·56	2·18	5·38	3·78	3·12	6·22	4·67
Mean	3·23	5·32	4·28	1·92	6·04	3·99	2·58	5·68	4·13
S.E.	0·22		0·48	0·25		0·65	0·18		0·47
Sig. Diff.	0·63		1·42	0·72		1·92	0·51		1·40

EXPERIMENT COS/XXIII

Location—Mwika
Altitude—4,700 feet
Lay-out—6 × 6 Latin square
Planted—3.4.51
Pruning—Multiple stem
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—Hedges of *Leucaena glauca* between each plot

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Clone	1953	1954	1955	Mean of 3 years 1953–1955	
				Cwt.	Percentages
N 29	1·95	1·66	3·46	2·35	80
N 81	2·08	1·43	7·13	3·54	120
R 15	1·52	2·43	5·44	3·13	106
I 56	2·16	2·93	2·90	2·66	91
N 219...	1·19	1·48	4·95	2·54	86
R 3	2·08	1·67	6·69	3·48	118
Mean	1·83	1·94	5·10	2·95	100
S.E.	0·28	0·48	0·97	0·27	9
Sig. Diff.	—	—	2·86	0·78	26

EXPERIMENT COS/XVIII

Location—Mwika
Altitude—4,700 feet
Lay-out—18 × 24 Randomized blocks. Blocks paired for comparison of Multiple and Single stem.
Planted—25.4.52
Pruning—Multiple and Single stem systems
Shade (a) Permanent—*Albizzia maranguensis*
(b) Semi-permanent—*Leucaena glauca*

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Selections	1954			1955			Mean of 2 years 1954–1955		
	Single Stem	Multiple Stem	Mean	Single Stem	Multiple Stem	Mean	Single Stem	Multiple Stem	Mean
KP 228	5·18	5·98	5·58	13·36	8·49	10·93	9·33	7·21	8·27
X 173	6·23	4·92	5·58	14·74	11·77	13·26	10·50	8·38	9·44
KP 423	3·75	6·38	5·07	12·20	8·06	10·13	8·06	7·21	7·64
KP 146	4·57	4·95	4·76	8·06	9·02	8·59	6·36	7·00	6·68
N 81	2·65	4·53	3·59	7·64	8·70	8·17	5·20	6·58	5·89
I 60	2·09	1·94	2·02	10·82	7·96	9·39	6·47	4·99	5·73
L 1...	4·40	3·43	3·92	8·80	7·21	8·01	6·58	5·41	6·00
N 39	8·41	10·60	9·51	9·86	5·20	7·53	9·12	7·96	8·54
N 14	7·11	8·18	7·65	7·42	11·24	9·33	7·32	9·76	8·54
R 2...	2·77	2·25	2·51	7·00	7·96	7·48	4·88	5·20	5·04
AC 80	2·39	3·91	3·15	7·85	8·91	8·38	5·20	6·47	5·84
I/255	7·01	8·91	7·96	12·41	9·55	10·98	9·76	9·23	9·50
H 1	6·65	6·32	6·49	13·90	6·58	10·24	10·29	6·47	8·38
N 218	6·82	9·94	8·38	8·70	6·15	7·42	7·85	8·06	7·96
N 197	3·84	6·13	4·99	12·09	8·91	10·50	7·96	7·53	7·75
H 66	4·29	4·49	4·39	11·14	13·05	12·10	7·74	8·80	8·27
N 128	4·12	6·46	5·29	6·05	8·27	7·16	5·09	7·42	6·26
N 169	6·68	9·45	8·07	7·64	6·36	7·00	7·21	7·96	7·59
Mean	4·95	6·04	5·50	9·98	8·52	9·25	7·50	7·31	7·41
S.E.	0·39		0·59	0·74		1·17	0·53		0·64
Sig. Diff.	–		1·65	–		3·29	–		1·80

	1954		1955		Mean of 2 years 1954–1955	
	S.E.	Sig. Diff.	S.E.	Sig. Diff.	S.E.	Sig. Diff.
Interactions	0·84	—	1·59	4·45	0·85	2·33

EXPERIMENT COS/XXIX

Location—Mbosho
Altitude—3,700 feet
Lay-out—18 × 24 Randomized blocks. Blocks paired for comparison of Multiple and Single stem
Planted—6.5.52
Pruning—Multiple and Single stem systems
Shade (a) Permanent—*Cordia holstii*
(b) Semi-permanent—*Leucaena glauca*

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Selections	1954			1955			Mean of 2 years 1954–1955		
	Single Stem	Multiple Stem	Mean	Single Stem	Multiple Stem	Mean	Single Stem	Multiple Stem	Mean
KP 228	7·74	9·86	8·80	15·91	28·85	22·38	11·88	19·30	15·59
X 173	9·97	11·56	10·76	19·52	32·25	25·89	14·85	21·96	18·41
KP 423	6·58	6·79	6·68	9·44	20·15	14·79	8·06	13·47	10·77
KP 146	7·21	9·65	8·43	12·73	28·64	20·69	9·97	19·20	14·59
N 81	5·83	8·38	7·11	12·20	25·35	18·78	9·02	16·97	13·00
I 60	4·77	6·79	5·78	11·88	18·35	15·12	8·38	12·52	10·45
L 1...	5·73	8·49	7·11	12·73	20·37	16·55	9·23	14·43	11·83
N 39	6·89	9·44	8·17	10·08	26·84	18·46	8·49	18·14	13·32
N 14	6·68	11·14	8·91	8·38	27·68	18·03	7·53	19·41	13·47
R 2...	5·94	7·53	6·74	6·58	15·80	11·19	6·26	11·77	9·02
AC 80	4·45	7·32	5·88	16·12	18·46	17·29	10·29	12·83	11·56
I/255	10·39	14·43	12·41	19·73	35·85	27·79	15·06	25·14	20·10
H 1	10·08	13·05	11·56	15·59	34·26	24·93	12·83	23·65	18·24
N 218	6·05	13·26	9·65	10·71	30·12	20·42	8·38	21·74	15·06
N 197	8·17	9·12	8·65	13·58	25·35	19·47	10·93	17·29	14·11
H 66	9·23	12·94	11·09	15·80	29·28	22·59	12·20	21·11	16·66
N 128	6·36	9·02	7·69	16·65	25·56	21·11	11·56	17·29	14·43
N 169	6·47	9·23	7·85	7·21	29·70	18·46	6·89	19·52	13·21
Mean	7·11	9·86	8·49	13·05	26·27	19·66	10·10	18·10	14·10
S.E.	0·42		0·59	0·74		1·27	0·53		0·74
Sig. Diff.	1·27		1·70	2·33		3·50	1·70		2·01

	1954		1955		Mean of 2 years 1954–1955	
	S.E.	Sig. Diff.	S.E.	Sig. Diff.	S.E.	Sig. Diff.
Interactions	0·84	—	1·80	4·99	1·06	2·97

EXPERIMENT II—SEEDLING SELECTION TRIALS

These trials are laid out in the form of four 6× 6 Latin squares, and two randomized blocks, each with nine selections repeated six times. The object of the experiment is to compare the yields of seedling progeny of potential selections under the conditions existing at this Station. The area had high light shade of *Albizzia maranguensis*, *Cordia holstii* and *Leucaena glauca* until June, 1950. In that year *Leucaena glauca* was removed and in 19 55 the *Cordia holstii* were stumped and have been kept down ever since.

EXPERIMENT II—LATIN SQUARE I.—PLANTED MAY, 1938—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	Mean of 5 years 1941–45	Mean of 6 years 1946–51	1952	1953	1954	1955	Mean of 4 years 1952–55	Mean of 15 years 1941–55	
								Cwt.	Percentages
F 502	4·62	10·57	3·81	6·31	12·23	9·84	8·04	7·91	122
P 280	4·60	8·78	2·03	4·75	6·78	10·41	6·00	6·64	102
P 313	4·51	9·86	1·63	6·21	9·14	14·63	7·90	7·56	116
P 348	3·13	8·18	3·40	4·64	8·93	9·04	6·50	6·00	92
P 147	2·70	8·51	3·15	5·37	8·09	8·24	5·28	5·97	92
P 190	1·63	6·79	2·78	5·08	5·79	11·03	6·17	4·90	75
Mean	3·53	8·78	2·80	5·39	8·49	10·53	6·65	6·50	100
S.E.	0·17	0·39	0·37	0·84	0·84	1·46	0·58	0·26	4
Sig. Diff.	0·51	1·16	1·10	—	2·49	—	1·70	0·76	12

EXPERIMENT II—LATIN SQUARE II.—PLANTED OCTOBER, 1938—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	Mean of 4 years 1942–45	Mean of 6 years 1946–51	1952	1953	1954	1955	Mean of 4 years 1952–55	Mean of 14 years 1942–55	
								Cwt.	Percentages
H 133	3·01	9·98	2·27	5·49	11·55	12·93	8·07	7·44	100
L 1...	3·12	11·42	2·70	10·02	12·77	16·50	10·50	8·78	118
F 839	3·69	10·88	4·51	7·96	12·23	9·33	8·51	8·25	111
N 39	2·71	10·69	6·59	8·29	13·09	14·63	10·65	8·40	113
P 147	2·17	8·52	3·88	4·81	10·14	6·92	6·44	6·11	82
E 59	2·13	7·92	2·61	4·19	8·93	7·53	5·82	5·60	75
Mean	2·82	9·90	3·76	6·79	11·45	11·31	8·33	7·43	100
S.E.	1·09	0·30	0·43	0·87	1·15	1·57	0·53	0·27	4
Sig. Diff.	—	0·89	1·26	2·55	—	4·62	1·55	0·80	11

EXPERIMENT II—LATIN SQUARE III.—PLANTED OCTOBER, 1938—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	Mean of 4 years 1942–45	Mean of 6 years 1946–51	1952	1953	1954	1955	Mean of 4 years 1952–55	Mean of 14 years 1942–55	
								Cwt.	Percentages
H 1	4·26	12·88	6·19	4·95	21·05	8·15	9·80	9·70	119
F 840	4·24	12·40	5·32	4·09	18·55	8·04	9·00	9·10	113
P 313	3·50	9·71	0·72	5·94	11·45	10·86	7·25	7·23	89
N 69	3·21	11·77	1·31	8·90	12·19	14·11	9·13	8·64	106
N 50	2·99	10·06	1·11	8·52	9·54	13·55	8·18	7·50	92
E 665	2·15	9·14	2·18	7·94	7·35	11·79	7·32	6·62	81
Mean	3·39	10·99	2·80	6·73	13·36	11·08	8·44	8·13	100
S.E.	0·26	0·45	0·31	1·12	0·91	1·93	0·67	0·41	5
Sig. Diff.	0·72	1·35	0·90	3·31	2·69	—	—	1·20	15

EXPERIMENT II—LATIN SQUARE IV.—PLANTED 1939—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Selection	Mean of 4 years 1942–45	Mean of 6 years 1946–51	1952	1953	1954	1955	Mean of 4 years 1952–55	Mean of 14 years 1942–55	
								Cwt.	Percentages
N 81	1·32	7·33	0·48	2·52	12·22	5·43	5·18	4·99	83
N 39	4·64	8·30	0·67	3·62	14·45	4·68	5·86	5·41	90
L 1...	1·51	8·36	0·26	2·30	12·88	3·92	4·52	5·40	90
H 1	3·11	11·18	1·93	3·83	19·45	5·53	7·69	7·90	132
N 197	1·56	10·30	0·95	4·43	16·08	7·32	7·55	6·92	115
R 3...	1·39	7·83	0·33	3·84	13·26	4·77	5·55	5·34	89
Mean	1·59	8·88	0·77	3·42	14·72	5·27	6·06	6·00	100
S.E.	0·11	0·52	0·19	0·45	1·18	0·97	0·62	0·37	6
Sig. Diff.	0·31	1·53	0·56	1·34	3·47	2·86	1·82	1·09	18

EXPERIMENT II—RANDOMIZED BLOCK I.—PLANTED APRIL, 1939—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	Mean of 4 years 1942–45	Mean of 6 years 1946–51	1952	1953	1954	1955	Mean of 4 years 1952–55	Mean of 14 years 1942–55	
								Cwt.	Percentages
R 11	1·03	9·55	0·25	6·87	9·66	10·84	6·90	6·36	87
R 2...	0·90	9·69	0·85	5·75	10·04	12·38	7·26	6·48	89
H 133	1·17	11·16	0·62	6·58	10·13	13·12	7·61	7·29	100
H 61	2·10	13·37	3·30	11·05	17·41	11·13	10·73	9·39	129
N 5	0·68	9·59	0·92	6·52	11·45	17·24	9·04	6·89	95
J 104	1·03	10·12	0·39	5·72	11·59	11·35	7·27	6·71	92
RRH	1·68	11·71	3·23	10·35	10·55	14·45	9·65	8·26	113
R 13	1·13	10·50	0·55	8·50	10·29	16·77	9·03	7·68	105
N 106	0·80	9·54	0·21	5·96	10·61	14·38	7·79	6·54	90
Mean	1·17	10·58	1·15	7·48	11·30	13·52	8·36	7·29	100
S.E.	0·13	0·36	0·38	0·97	1·03	1·91	0·63	0·29	4
Sig. Diff.	0·38	1·04	1·08	2·76	2·94	—	1·80	0·84	12

EXPERIMENT II—RANDOMIZED BLOCK II.—PLANTED APRIL, 1939—SINGLE STEM YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	Mean of 4 years 1942–45	Mean of 6 years 1946–51	1952	1953	1954	1955	Mean of 4 years 1952–55	Mean of 14 years 1942–55	
								Cwt.	Percentages
N 100	1·33	8·39	0·40	7·25	7·95	12·43	7·24	5·97	106
N 217	1·20	7·96	0·44	5·75	6·97	11·87	6·26	5·54	99
R 1...	1·23	7·91	0·56	5·73	8·74	12·37	6·85	5·69	101
N 229	1·04	7·71	0·43	5·41	7·33	13·52	6·68	5·51	98
N 34	1·03	7·54	0·33	3·44	8·88	9·29	5·49	5·09	91
E 325	0·94	7·78	0·62	5·65	8·44	6·45	5·29	5·11	91
N 182	0·91	7·80	0·52	5·25	8·05	11·78	6·40	5·92	106
N 215	1·10	7·68	0·45	4·99	9·09	10·66	6·30	5·40	96
J 49	1·45	8·80	0·25	5·74	11·16	11·36	7·13	6·22	111
Mean	1·13	7·95	0·44	5·47	8·51	11·08	6·40	5·61	100
S.E.	0·09	0·37	0·13	0·92	1·14	2·20	0·70	0·34	6
Sig. Diff.	0·26	—	—	—	—	—	—	—	—

KENT PLOT SELECTIONS—SINGLE STEM
SUMMARY OF YIELDS, CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Tree No.	Mean of 4 years 1938–41	Mean of 6 years 1942–47	Mean of 6 years 1948–53	1954	1955	Mean of 2 years 1954–55	Mean of 18 years 1938–55
KP 146	19·93	9·86	4·69	7·64	—	3·82	9·70
KP 147	12·86	6·56	3·48	9·12	—	4·56	6·71
KP 151	9·04	6·45	6·20	15·27	T	7·64	7·07
KP 154	13·38	8·33	12·36	10·93	1·06	6·00	10·54
KP 162	14·08	3·13	2·71	5·83	T	2·92	5·40
KP 163	14·62	11·30	11·03	10·39	3·18	6·79	11·45
KP 164	8·43	10·93	20·40	5·20	17·50	11·35	13·58
KP 176	11·67	4·19	4·74	8·91	T	4·46	6·07
KP 204	11·66	11·07	8·23	7·21	3·61	5·41	9·63
KP 214	11·97	3·93	3·44	2·33	0·85	1·59	5·29
KP 215	12·09	14·91	11·18	7·96	15·38	11·67	12·68
KP 218	10·99	8·53	8·40	11·56	4·77	8·17	8·99
KP 226	12·92	3·92	4·97	2·97	6·89	4·93	6·38
KP 227	17·04	7·98	6·59	9·76	1·17	5·47	9·25
KP 228	13·68	7·11	6·64	8·38	1·48	4·93	8·17
KP 231	14·36	10·23	11·74	13·68	1·17	7·43	11·34
KP 260	10·25	11·63	11·90	12·94	0·53	6·74	10·87
KP 261	8·63	7·07	6·81	8·27	1·80	5·04	7·10
KP 262	12·35	11·92	7·49	10·50	0·53	5·52	9·83
KP 263	13·46	7·23	8·04	11·67	5·30	8·49	9·02
KP 265	11·60	12·92	13·33	14·32	5·94	10·13	12·45
KP 266	8·71	7·84	8·53	10·93	4·14	7·54	8·23
KP 281	7·07	6·05	10·81	5·30	1·70	3·50	7·58
KP 285	11·84	10·04	12·91	8·06	21·85	14·96	11·94
KP 289	10·92	9·90	9·49	14·96	0·53	7·75	9·75
KP 352	11·48	6·78	16·08	9·55	19·41	14·48	11.78
KP 362	12·79	8·90	13·65	23·23	2·23	12·73	11·77
KP 405	6·68	10·41	22·49	5·94	39·35	22·65	14·97
KP 406	8·51	10·40	18·28	8·70	37·55	23·13	14·02
KP 409	9·59	10·67	15·60	7·74	32·67	20·21	13·13
KP 412	11·23	7·42	15·10	3·50	44·97	24·24	12·70
KP 414	8·98	6·94	15·00	5·73	37·23	21·48	11·70
KP 423	13·40	16·03	12·80	14·11	14·00	14·06	14·15
KP 466	10·58	8·09	14·07	7·11	29·17	18·14	11·75
KP 512	10·02	8·53	9·93	15·49	5·20	10·35	9·53
KP 518	8·99	6·96	6·73	15·59	3·08	9·34	7·60
KP 532	12·51	8·40	14·28	6·89	30·97	18·93	12·14
KP 683	13·26	7·88	12·80	1·27	18·67	9·97	10·95
KP 685	10·62	9·12	14·85	6·05	6·36	6·21	11·04

*Stumped in 1943. T = Trace.

EXPERIMENT IIIB

This experiment is designed to test four methods of multiplication of coffee. It is laid out in randomized blocks repeated six times. Plots are split to test three selections, and their interaction with the main treatments.

The experiment was planted in April, 1951.

MAIN TREATMENTS:

A = Clone.

B = Seedling of original parent.

C = Seedling of clone.

D = Second generation seedling.

SUB-TREATMENTS (SELECTIONS):

N 39.

N 5.

H 66.

EXPERIMENT IIIB—1955 CROP
YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	A	B	C	D	Selection Mean
N 39	20·92	17·26	13·89	17·79	17·47
H 66	22·16	14·70	14·41	11·40	15·67
N 5	15·58	19·55	13·26	19·25	16·91
Treatment Mean	19·55	17·17	13·85	16·15	16·68

	S.E.	Sig. Diff.
Body of table	1·27	... 3·83
Selections	0·62	... –
Treatments	1·23	... 3·51

EXPERIMENT IIIB.—MEAN OF THREE YEARS 1953–55 CROP
YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	A	B	C	D	Selection Mean
N 39	17·06	16·22	14·76	16·16	16·05
H 66	16·77	14·61	14·14	13·08	14·66
N 5	14·94	15·26	12·44	15·53	14·54
Treatment Mean	16·25	15·36	13·78	14·92	15·08

	S.E.	Sig. Diff.
Body of table	0·55	... 1·64
Selections	0·27	... 0·75
Treatments	0·52	... 1·49

EXPERIMENT IIIB.—ANNUAL AND MEAN YIELDS FOR THE YEARS 1953–55
YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

		1953	1954	1955	Mean of 3 years 1953–55
N 39	A	12·40	17·83	20·92	17·06
	B	8·52	22·85	17·26	16·22
	C	7·41	22·94	13·89	14·76
	D	6·43	24·20	17·79	16·16
H 66	A	12·17	15·97	22·16	16·77
	B	8·50	20·61	14·70	14·61
	C	7·19	20·82	14·41	14·14
	D	5·86	22·04	11·40	13·08
N 5	A	9·95	19·23	15·58	14·94
	B	6·58	19·64	19·55	15·26
	C	6·46	17·55	13·26	12·44
	D	7·64	19·71	19·25	15·53

EXPERIMENT XIVA—MULCH—PLANTED 1940

Laid out as a 5×5 Latin square with split plots to show the effects of sulphate of ammonia, this experiment is designed to determine the effects on yield of banana trash, guinea grass (*Panicum maximum*) and the elephant grass (*Pennisetum purpureum*) applied as mulches, compost made from an equivalent amount of elephant grass, and clean cultivation. The trees are clonal material from unselected mother trees and are pruned on the single stem system. The area is sparsely shaded with *Albizzia maranguensis* as the permanent shade tree.

TREATMENTS:

A=Control—routine clean cultivation.
B=Banana trash (80 lb. per tree).
C=Elephant grass (80 lb. per tree).
D=Guinea grass (80 lb. per tree).
E=Compost (80 lb. per tree).

The mulches were applied for the period 1940 to 1951. Increases in yield resulted during the first six seasons of bearing but these were not significant. The mean yields for all the treatments for the subsequent four-season period (seventh, eighth, ninth and tenth bearing years) showed a significant increase over the nil treatment.

In 1951 the treatments were discontinued but the plots have been recorded for four seasons in order to obtain information on the residual effects of the various treatments.

EXPERIMENT XIVA

YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Treatments	Mean 1942–51	Mean 1948–51	RESIDUAL EFFECTS				
			1952	1953	1954	1955	Mean 1952–55
A	7·41	11·02	6·95	6·29	16·70	6·84	9·20
B	8·74	13·46	5·88	9·30	20·37	11·07	11·66
C	8·39	12·77	5·87	8·57	18·33	9·72	10·62
D	8·45	12·64	5·63	8·18	19·26	10·96	11·01
E	8·10	12·28	7·65	8·03	19·33	9·73	11·19
Mean	8·22	12·44	6·40	8·07	18·80	9·67	10·74
S.E.	0·34	0·36	0·60	0·56	0·71	1·99	0·62
Sig. Diff.	—	1·11	—	1·73	2·19	—	—

EXPERIMENT XV.—IRRIGATION AND MULCH—PLANTED 1940

This is a complex confounded factorial experiment laid out as an 8×8 quasi-latin square. It is designed to investigate the effects of irrigation and mulch, both separately and in combination, on coffee culture. The material used for mulching is dried banana trash. The experiment is planted with four different clones, from unselected mother-trees, and the behaviour of these clones is also recorded. They are pruned on the single stem system. The area is unshaded.

The treatments were modified as from July, 1951, since then it has been considered observation plot only but yields have been recorded.

Treatments:

1940 to June, 1951.	July, 1951 onwards.
Irrigation:	
0 = Nil.	0 = As before.
1 = Made up to 2 inches of effective rainfall monthly.	1 = As before.
2 = Made up to 4 inches of effective rainfall monthly.	2 = 1 inch monthly.
3 = Made up to 2 inches of effective rainfall fortnightly.	3 = 2 inches from September to March inclusive.

Mulch:

0 = Nil.
1 = Banana trash 40 lb. per tree at end of long rains.
2 = Banana trash 80 lb. per tree at end of long rains.
3 = Banana trash 40 lb. per tree at end of both long and short rains.

0 = As before.
1 = As before.
2 = 20 lb. in June.
3 = 20 lb. in June and December.

Clone:

1 = KIL 50.
2 = KIL 98.
3 = KIL 48.
4 = KIL 10.

A summary of the yields for the years 1942–51 is given below, as well as details of the yields for the years after the change of treatments.

EXPERIMENT XV.—PLOT YIELDS

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

Irrigation	Mulch	Mean 1942–51	1952	1953	1954	1955	Mean 1952–55
0	0	4·57	7·95	2·61	14·25	0·36	6·30
0	1	7·24	10·26	6·84	21·48	1·76	10·08
0	2	7·21	9·35	7·31	20·78	2·27	9·93
0	3	6·60	10·75	4·47	17·35	1·66	8·56
1	0	6·93	9·53	3·04	13·67	0·27	6·63
1	1	8·89	11·82	5·88	21·70	1·37	10·20
1	2	8·06	8·47	6·17	20·30	2·61	9·39
1	3	8·51	11·46	4·58	22·85	1·35	10·06
2	0	7·20	7·23	4·61	14·68	0·29	6·70
2	1	8·44	12·74	6·56	19·28	1·20	9·95
2	2	8·08	12·27	6·54	21·09	1·41	10·33
2	3	8·05	11·27	6·04	22·49	1·86	10·41
3	0	6·10	5·92	2·67	10·14	0·33	4·77
3	1	8·39	13·03	5·87	20·70	0·59	10·05
3	2	8·52	11·92	9·17	19·88	2·33	10·83
3	3	7·80	10·89	7·29	22·07	2·47	10·67

EXPERIMENT XV.—TABLE SHOWING INTERACTION OF IRRIGATION AND MULCH

MEAN YIELDS OF 4 YEARS 1952–55

Mulch	Irrigation 0	1	2	3	Mean
0	6·30	6·63	6·70	4·77	6·10
1	10·08	10·20	9·95	10·05	10·07
2	9·93	9·39	10·33	10·83	10·12
3	8·56	10·06	10·41	10·67	9·92
Mean	8·72	9·07	9·35	9·08	9·06

Standard Error for Marginal means — 0·36.
Significant Difference for marginal means (mulch) — 1·06.
Standard Error of Entries in body of table — 0·72.

EXPERIMENT XIX

This experiment was planted in 1949 with the object of comparing the yields on multiple stem both with and without interplanted bananas and with and without manure. It is laid out as a randomized block repeated eight times. Each block is planted with a different selection.

TREATMENTS:

A = No bananas.
B = As A plus 1 debe (petrol tin) of manure per tree.
C = As A plus 2 debes (petrol tins) of manure per tree.
D = Bananas interplanted at 90 stools per acre.
E = As D plus 1 debe (petrol tin) of manure per tree.
F = As D plus 2 debes (petrol tins) of manure per tree.
G = Bananas interplanted at 135 stools per acre.
H = As G plus 1 debe (petrol tin) of manure per tree.
I = As G plus 2 debes (petrol tins) of manure per tree.

EXPERIMENT XIX

YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

TREATMENTS

	1952	1953	1954	1955	Mean of 4 years 1952–1955	
					Cwt.	Percentages
A	4·83	9·92	13·22	2·32	7·58	125
B	7·10	11·62	11·01	3·71	8·46	140
C	5·10	9·96	11·78	2·56	7·35	121
D	1·88	6·96	9·09	2·47	5·10	84
E	2·34	9·52	9·47	2·76	6·02	100
F	2·45	8· 0	10·03	2·30	5·51	91
G	1·34	6·68	9·07	2·21	4·83	80
H	1·13	7·00	8·68	2·45	4·82	80
I	1·16	6·43	9·25	2·57	4·77	79
Mean	3·04	8·48	10·18	2·60	6·05	100
S.E.	0·68	0·67	0·56	0·39	0·37	6
Sig. Diff.	1·94	1·92	1·59	—	1·06	18

SELECTIONS

	1952	1953	1954	1955	Mean of 4 years 1952–1955	
					Cwt.	Percentages
KP 162	3·59	9·12	13·81	1·42	6·98	115
N 197	3·24	10·02	10·52	3·71	6·87	114
N 218	5·34	7·34	9·65	2·44	6·19	104
N 71	1·40	6·11	9·42	2·62	4·88	81
N 29	2·63	8·10	9·74	2·41	5·51	91
KIL 10	2·59	10·91	11·91	2·90	7·09	117
N 5	1·98	7·92	7·91	2·93	5·18	86
N 110	3·52	8·30	8·46	2·33	5·65	93
Mean	3·04	8·48	10·18	2·60	6·05	100

EXPERIMENT XIX

INTERACTION TABLE OF BANANA DENSITIES AND RATES OF APPLICATION OF MANURE MEAN YIELD OF 4 YEARS 1952-55

MANURE	BANANAS			Mean
	0 Nil	1 90 stools/ acre	2 135 stools/ acre	
0 Nil	7·58	5·10	4·83	5·84
1 1 debe per tree and per stool ...	8·46	6·02	4·82	6·43
2 2 debes per tree and per stool ...	7·35	5·51	4·77	5·88
Mean	7·80	5·54	4·81	6·05

Sig. Diff. for Marginal means (Bananas) —0·61.

EXPERIMENT XIII.—METHOD OF PRUNING—PLANTED DECEMBER, 1935

This experiment is laid out as 3 × 3 Latin square, repeated three times in different parts of the Station. It is designed to compare three systems of pruning arabica coffee. Two of the replicates are lightly shaded with *Albizzia maranguensis;* the third is unshaded. The experiment is planted with seedling material.

Treatments:

S = Single stem.
M/3 = Multiple stem—3 suckers.
M/A = Multiple stem—Agobiada—3 suckers.

A summary of the results over the bearing period is given below. The yields for the earlier years have been averaged in groups; reference may be made to the Annual Report for the 1953/54 season for details of the annual yields during these periods.

EXPERIMENT XIII

YIELDS EXPRESSED AS CWT. OF CLEAN COFFEE PER ACRE

	Mean 1938–43	Mean 1944–53	1954	1955	Mean 1954–55	Mean of 18 years 1938–1955	
						Cwt.	Percentages
Multiple stems Agobiada...	5·66	10·11	12·27	7·53	10·35	8·65	92
Multiple stems 3 suckers ...	9·46	11·56	13·83	7·83	10·84	10·78	114
Single stem	3·67	11·14	13·15	14·39	13·33	8·89	94
Mean	6·26	10·94	13·08	9·92	11·51	9·44	100
S.E.	0·28	0·27	0·74	0·84	0·47	0·23	2
Sig. Diff.	0·98	0·92	—	2·91	1·62	0·80	8

EXPERIMENT XXI

This experiment is designed to compare two methods of establishing the single stem method of pruning with three methods of establishing the multiple stem system. The lay-out consists of a 5 × 5 Latin square.

Treatments:—Planted April, 1951:

A = Single stem—capped at 21 in.—to be capped thrice in all.
B = Single stem—capped at 36 in,—to be capped twice in all.
C = Multiple stem—capped at 21 in.—Three suckers from below 10 in.
D = Multiple stem—One uncapped stem.
E = Multiple stem—Two suckers from top node.

EXPERIMENT XXI

YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

Treatments	1953	1954	1955	Mean of 3 years 1953–1955	
				Cwt.	Percentages
A	4·69	7·77	6·38	6·28	76
B	6·30	12·07	6·89	8·42	102
C	2·75	11·75	16·02	10·17	123
D	5·22	14·12	1·15	6·83	83
E	3·92	14·20	10·46	9·52	115
Mean	4·57	11·98	8·18	8·25	100
S.E.	0·49	0·74	1·16	0·62	8
Sig. Diff.	1·51	2·29	3·57	1·91	23

MISCELLANEOUS PRUNING TRIAL No. 1

This experiment is designed to compare the yields obtained from multiple stem trees having a varying number of stems. The trees were planted in 1949, but the yields for the first two bearing years were not recorded. The area is unshaded.

YIELDS CALCULATED AS CWT. OF CLEAN COFFEE PER ACRE

	1953	1954	1955	Mean of 3 years 1953–1955	
				Cwt.	Percentages
2 stems	8·55	12·43	0·99	7·85	89
3 stems	10·15	11·74	1·13	8·20	92
4 stems	11·83	11·85	2·37	9·30	105
5 stems	13·20	12·23	3·15	10·15	114
Mean	10·93	12·07	1·91	8·87	100
S.E.	1·06	0·83	0·85	0·57	6
Sig. Diff.	3·26	—	—	—	—

GRADES AND CLASSIFICATIONS OF THE 1955/56 CROP

Total estimated crop expressed as clean coffee 66·06 tons.

This total is made up as follows:—

	Parch. in tons		Clean in tons
Lots 1–8, inclusive sent to Curing Works as No. 1 parchment	74·28	...	60·99
Lot 9 sent to Curing Works as coff-rest	1·21	...	0·59
Lot 10 Buni 2,053 lb. sent to Curing Works	–	...	0·54
Seed:—			
(a) Equivalent to 5,601 lb. sold	2·50	...	2·00
(b) Reclaimed seed plus No. 3 parchment (sold as clean)	1·52	...	1·22
Samples from plots	0·93	...	0·74
	80·44	...	66·08

Maragojipe coffee (clean) 0·23 tons approximately.
Robusta coffee (clean) 0·20 tons approximately.
Excelsa coffee (clean) 0·13 tons approximately.

The grading and classification of Lots 1–9 inclusive amounting to 61.58 tons of clean coffee was:—

GRADING			CLASSIFICATION		
Grades	lb.	Percentage	Class	lb.	Percentage
PB	7,410	5·4	1	–	–
AA	44,985	32·6	2	20,709	15·0
A	59,302	43·0	3	55,397	40·2
B	8,256	6·0	4	9,619	7·0
E	875	0·6	5	25,413	18·4
AF	6,805	4·9	6	9,128	6·6
C	608	0·4	7	5,730	4·2
TT	3,216	2·3	8	2,183	1·6
T	410	0·3	9	1,993	1·4
F	5,986	4·3	10	3,607	2·6
HP	89	0·1	11	2,753	2·0
			12	854	0·6
			13	556	0·4
Total ...	137,942	99·9	—	137,942	100·0
	=61·58 tons			=61·58 tons	

81·0 per cent was PB.s, AA.s, and A.s, and 80·6 per cent was better than class 6. Average out-turn or 1955/56 crop = 382 debes of cherry to a ton of parchment.

MONTHLY RAINFALL FROM SEPTEMBER 1934 TO END OF AUGUST 1955 IN INCHES

	Sept. 1934 to end of Aug. 1935	Sept. 1935 to end of Aug. 1936	Sept. 1936 to end of Aug. 1937	Sept. 1937 to end of Aug. 1938	Sept. 1938 to end of Aug. 1939	Sept. 1939 to end of Aug. 1940	Sept. 1940 to end of Aug. 1941	Sept. 1941 to end of Aug. 1942	Sept. 1942 to end of Aug. 1943	Sept. 1943 to end of Aug. 1944	Sept. 1944 to end of Aug. 1945	Sept. 1945 to end of Aug. 1946	Sept. 1946 to end of Aug. 1947	Sept. 1947 to end of Aug. 1948	Sept. 1948 to end of Aug. 1949	Sept. 1949 to end of Aug. 1950	Sept. 1950 to end of Aug. 1951	Sept. 1951 to end of Aug. 1952	Sept. 1952 to end of Aug. 1953	Sept. 1953 to end of Aug. 1954	Sept. 1954 to end of Aug. 1955
September ...	0·76	0·50	1·87	1·03	0·17	1·61	0·33	2·76	0·11	0·49	2·42	0·20	7·34	1·23	0·30	0·33	1·87	0·24	3·29	1·77	0·33
October ...	0·34	0·99	0·22	4·35	2·16	0·08	1·03	0·09	0·42	0·17	3·15	0·05	4·71	1·27	0·69	0·80	2·40	0·08	1·69	0·24	
November ...	2·18	2·92	0·41	3·91	2·57	0·57	0·90	4·47	3·60	2·00	3·10	4·66	1·13	0·93	1·65	0·26	0·88	8·65	3·53	5·35	1·07
December ...	3·35	4·02	5·51	1·64	1·02	0·32	1·07	9·72	1·75	0·32	5·14	0·30	2·19	1·31	6·19	1·38	0·91	4·89	0·39	1·51	0·87
January ...	0·11	3·28	0·32	0·52	0·22	2·83	1·23	1·59	0·07	1·02	1·72	0·02	2·01	0·46	1·79	2·06	4·19	3·63	1·54	1·96	0·71
February ...	8·91	5·32	0·13	2·43	0·41	5·27	1·91	0·38	2·61	1·69	1·39	1·14	0·72	0·71	4·17	3·01	2·58	1·17	0·92	2·52	5·89
March	6·45	2·28	9·44	12·42	4·57	4·12	2·38	15·02	1·32	5·82	4·85	0·57	3·37	2·72	0·10	7·09	3·20	3·06	1·24	0·15	4·27
April	13·87	29·63	37·23	10·79	26·18	21·63	15·92	37·07	7·95	30·04	15·19	16·90	28·45	14·50	9·34	16·20	20·45	11·66	15·22	21·05	15·39
May	28·77	26·59	33·05	19·44	25·31	12·04	10·24	19·43	19·46	11·97	21·34	22·74	25·73	15·56	10·64	24·96	19·38	12·65	12·51	18·04	17·08
June	5·25	8·74	6·03	2·61	8·74	2·68	5·09	4·54	4·06	4·65	3·45	2·54	10·97	2·93	0·92	5·09	7·20	3·03	2·02	1·35	5·44
July	1·70	4·80	1·26	1·92	0·77	2·04	0·76	2·38	4·42	2·21	3·15	0·59	1·43	1·53	1·86	1·81	2·09	1·38	2·02	0·30	2·00
August... ...	1·63	2·37	2·29	0·67	0·54	2·58	2·10	1·22	0·37	1·43	1·33	1·03	1·38	0·44	0·82	0·88	1·60	0·74	2·10	1·70	0·64
Total (in inches)	73·32	91·44	97·76	61·73	72·66	55·77	42·96	98·67	46·14	61·81	66·23	50·74	89·43	43·59	40·29	63·76	66·15	53·50	44·86	57·39	53·93

Rainfall for remaining months of 1955. September ... 0·07
October ... 0·09
November ... 2·78
December ... 3·18